PRICE AND OUTPUT DETERMINATION: PURE MONOPOLY

Let us now jump to the opposite end of the industry spectrum and examine the characteristics, the bases, the price-output behavior, and the social desirability of pure monopoly.

CONCEPT AND OCCURRENCE OF PURE MONOPOLY

Pure or absolute monopoly exists when a single firm is the sole producer of a product for which there are no close substitutes. By the absence of close substitutes we mean that there are no other firms producing the same product or products varying only in very minor ways from that of the monopolist. Thus there is no close substitute for the electricity or water supplied by local utilities. And, if there existed only one manufacturer of automobiles, consumers would have no reasonably good alternative to buying from the monopolistic producer. Of course, as mentioned earlier, there may be competition in the broad sense that a food freezer or color television set is a "substitute" for a down payment on an automobile. But these products are clearly distinct from automobiles and do not fulfill the consumer's need for convenient local transportation. The important point is that the monopolist is the only supplier of a certain product for which there are no close substitutes available. Defined in this way, pure monopoly is a rare phenomenon.

Yet a brief analysis of pure monopoly is important for two related reasons. First, some industries are reasonable approximations of pure monopoly. The behavior of firms with 80, 70, or even 60 per cent of a market can often be explained with considerable accuracy through the pure monopoly market model. For all practical purposes the dominant firm *is* the industry in such instances. Second, a study of pure monopoly provides us with valuable insights concerning the more realistic market structures of monopolistic competition and oligopoly, which will be discussed in Chapters 28 and 29. These two market situations combine in differing degrees the characteristics of pure competition and pure monopoly.

BARRIERS TO ENTRY

It was noted in Chapter 22 that the absence of competitors which characterizes pure monopoly is largely explainable in terms of barriers to entry, that is, considerations which prohibit additional firms from entering an industry. These barriers are also pertinent in explaining the existence of oligopoly and monopolistic competition between the market extremes of pure competition and pure monopoly. In the case of pure monopoly entry barriers are sufficiently great to block completely all potential competition. Somewhat less formidable barriers permit the existence of oligopoly, that is, a few firms. Still weaker barriers permit the fairly large number of firms which characterize monopolistic competition. The virtual absence of entry barriers helps explain the very large number of competing firms which is the basis of pure competition. The important point is this: Barriers to entry are

pertinent not only to the extreme case of pure monopoly but also to the "partial monopolies" which are so characteristic of American capitalism.

What forms do these entry barriers assume?

Economies of Scale

Modern technology is such in many industries that efficient, low-cost production can be achieved only if producers are extremely large both absolutely and in relation to the market (see Chapter 25). Where economies of scale are very significant, a firm's average-cost schedule will decline over a wide range of output. Given product demand, the achieving of low unit costs and therefore low unit prices for consumers depends upon the existence of a small number of firms or, in the extreme case, only one firm. The automobile, aluminum, and steel industries are a few of many heavy industries which reflect such conditions. If three firms currently enjoy all available economies of scale and each has roughly one-third of a market, it is easy to see why new competitors may find it extremely difficult to enter this industry. On the one hand, new firms entering the market as small-scale producers will have little or no chance to survive and expand. Why? Because as small-scale entrants they will be unable to realize the cost economies enjoyed by the existing "Big Three" and therefore will be unable to realize the profits necessary for survival and growth. New competitors in the steel and automobile industries will not come about as the result of the successful operation and expansion of small "back-yard" producers. They simply will not be efficient enough to survive. The other option is to start out big, that is, to enter the industry as a large-scale producer. In practice, this is virtually impossible. It is extremely unlikely that a new and untried enterprise will be able to secure the money capital needed to obtain capital facilities comparable to those accumulated by any of the Big Three in the automobile industry.

The financial obstacles in the way of starting big are so great in many cases as to be prohibitive.

Public Utilities: Natural Monopolies

In a few industries economies of scale are particularly pronounced, and at the same time competition is impractical, inconvenient, or simply unworkable. Such industries are called *natural monopolies*, and most of the so-called public utilities—the electric and gas companies, bus and railway firms, and water and communication facilities—can be so classified. These industries are generally given exclusive franchises by government. But in return for this sole right to supply electricity, water, or bus service in a given geographic area, government reserves the right to regulate the operations of such monopolies to prevent abuses of the monopoly power it has granted.

Let us examine some illustrations. It would be exceedingly wasteful for a community to have a number of firms supplying water or electricity. Technology is such in these industries that heavy fixed costs on generators, pumping and purification equipment, water mains, and transmission lines are required. This is aggravated by the fact that capital equipment must be sufficient to meet the peak demands which occur on hot summer days when lawns are being watered and air conditioners turned on. These heavy fixed costs mean that unit costs of production decline with the number of cubic feet of water or kilowatt hours of electricity supplied by each firm. The presence of a number of water and electricity suppliers would divide the total market and reduce the sales of each competitor. Each firm would be pushed back up its declining average-cost curve. Firms would underutilize their fixed plants with the result that unit cost and therefore electricity and water rates would necessarily be high. In addition, competition might prove to be highly inconvenient. For example, the presence of a half dozen telephone companies in a municipality would

entail the inconvenience of having six telephones and six telephone books—not to mention six· telephone bills—to ensure communications with all other residents in the same town.

Because firms are eager to spread their fixed costs and thereby achieve lower unit costs, cutthroat price competition tends to break out when a number of firms exist in these public utilities industries. The result may be losses, the bankruptcy of weaker rivals, and the eventual merger of the survivors. The evolving pure monopoly may be anxious to recoup past losses and to profit fully from its new position of market dominance by charging exorbitant prices for its good or service.

To spare society from such disadvantageous results, government will usually grant an exclusive franchise to a single firm to supply water, natural gas, electricity, telephone service, or train or bus transportation. In return government reserves the right to designate the monopolist's geographic area of operation and the prices which it may charge. The result is a regulated or government-sponsored monopoly—monopoly designed to achieve low unit costs but regulated to guarantee that consumers will benefit from these cost economies.

Ownership of Essential Raw Materials

The institution of private property can be used by a monopoly as a means of achieving an effective obstacle to potential rivals. A firm owning or controlling a raw material which is essential in production can obviously prohibit the creation of rival firms. There are several classic examples. The Aluminum Company of America retained its monopoly position in the aluminum industry for many years by virtue of its control of all basic sources of bauxite, the major ore used in aluminum fabrication. The International Nickel Company of Canada controls approximately 90 per cent of the world's known nickel reserves. Most of the world's diamond mines are owned by the De Beers Company of South Africa. About 95 per cent of the world's molybdenum reserves are owned by the Climax Molybdenum Company.

Patents and Research

By granting an inventor the exclusive right to control a product for some seventeen years, American patent laws are aimed at protecting an inventor from having his product or process usurped by rival enterprises which have not shared in the time, effort, and money outlays which have gone into its development. By the same token, of course, patents may provide the inventor with a monopoly position for the life of the patent. Patent control figures prominently in the growth of many modern-day industrial giants—National Cash Register, General Motors, General Electric, du Pont, to name a few. The United Shoe Machinery Company provides a notable example of how patent control can be abused to achieve monopoly power. In this case United Shoe became the exclusive supplier of certain essential shoemaking machines through patent control. It extended its monopoly power to other types of shoemaking machinery by requiring all lessees of its patented machines to sign a "tying agreement" in which shoe manufacturers agreed also to lease all other shoemaking machinery from United Shoe. This allowed United Shoe to monopolize the market until partially effective antitrust action was taken by the government in 1955.

Research, of course, underlies the development of patentable products. Firms which gain a measure of monopoly power by their own research or by purchasing the patents of others are in a strategic position to consolidate and strengthen their market position. The profits provided by one important patent can be used to finance the research required to develop new patentable products. Monopoly power achieved through patents may well be cumulative.

Unfair Competition

A firm's rivals may be eliminated and the entry of new competitors blocked by aggressive, cutthroat tactics. Familiar techniques entail product disparagement, pressure on resource suppliers and banks to withhold materials and credit, the hiring away of strategic personnel, and aggressive price cutting designed to bankrupt competitors. Though many of these facets of unfair competition are now illegal or fringe upon illegality, they are of more than historical interest. For example, although Federal legislation prohibits price cutting intended to reduce competition, how is one to distinguish in practice between legitimate price competition based upon cost advantages and price competition designed to bankrupt rivals?

Economies of Being Established

A bit of reflection will reveal that for a variety of reasons an established, going concern has numerous advantages over new, embryonic rivals. There are good reasons why existing firms should survive and prosper, whereas new firms have every reason to founder and fail. Established firms which have proved themselves by their continued existence and prosperity will have relatively easy access to the capital market, on favorable terms. This advantage is not unrelated to the fact that an established concern will tend to have a relatively efficient administrative framework staffed by competent and experienced personnel. The firm's longevity will have allowed it to eliminate inappropriate policies and to have screened the dolts from its administrative ranks. It must be added that going concerns will also be in a position to expand their size and market share by internal financing.

The new concern may have great difficulties in securing needed money capital. Its personnel and policies are untried and untested; it is an industrial question mark. If funds are available to newcomers, the added risks of investing in a new concern are likely to make the terms unattractive to the firm.

In addition, an established firm will be likely to have a widely known and highly advertised product, which it sells through well-established marketing channels to long-standing customers. A new firm faces serious financial obstacles in developing and advertising a product, in establishing marketing outlets, and in building up a clientele.

Two Implications

Our discussion of barriers to entry suggests two noteworthy points. First, barriers to entry are rarely complete; indeed, this is simply another way of stating our earlier point that pure monopoly is rare. Although, as we have seen, research and technological advance may strengthen the market position of a firm, technology may also undermine existing monopoly power. Existing patent advantages may be circumvented by the development of new and distinct, yet substitutable, products. New sources of strategic raw materials may be found. It is probably not an overstatement to say that monopoly in the sense of a one-firm industry only persists over time with the sanction or aid of government.

Second, it is implied in our discussion that monopolies may be desirable or undesirable from the standpoint of economic efficiency. The public utilities and economies-of-scale arguments suggest that market demand and technology may be such that efficient low-cost production presupposes the existence of monopoly. On the other hand, our comments upon materials ownership, patents, and unfair competition as sources of monopoly imply more undesirable connotations of business monopoly.

With these points in mind let us analyze the price-output behavior of a pure monopolist. Important insights with respect to the social desirability of monopoly will be revealed by this analysis.

PRICE AND OUTPUT DETERMINATION

Let us assume a pure monopolist who through, say, patent and materials control is able to block the entry of new firms to the market. Suppose, too, that the monopolist is unregulated; he is unhampered by the existence or the prospect of a regulatory commission. In short, we have a monopolist who is ideally situated to exploit his market fully. The pure monopolist will determine his profit-maximizing output on the basis of his cost and demand data.

Monopoly Demand

The crucial difference between a pure monopolist and a purely competitive seller lies on the demand side of the market. We recall from Chapter 26 that the purely competitive seller faces a perfectly elastic demand schedule at the market price determined by industry supply and demand. The competitive firm can sell as much or as little as it wants at the going market price. It follows that each additional unit sold will add a constant amount—its price—to the firm's total revenue. In other words, for the competitive seller marginal revenue is constant and equal to product price. But the competitive seller can do nothing about market price; he has no price policy. For better or worse, he must accept the market-determined price.

The monopolist's demand curve is much different. Because the pure monopolist *is* the industry, his demand, or sales, curve is the industry demand curve. And the industry demand curve is not perfectly elastic but rather is downsloping.[1] This is illustrated by columns 1 and 2 of Table 27–1.

There are two implications of a down-sloping demand curve which must be understood. In the first place, a downsloping demand curve means that a pure monopoly can increase its sales only by charging a lower unit price for its product. *Furthermore, the fact that the monopolist must lower price to boost sales causes marginal revenue to be less than price (average revenue) for every level of output save the first.* The reason? Price cuts will apply not only to the extra output sold but also to all other units of output which otherwise could have been sold at a higher price. Each additional unit sold will add to total revenue its price less the sum of the price cuts which must be taken on all prior units of output.[2] The marginal revenue of the second unit of output in Table 27–1 is $142 rather than its $152 price, because a $10 price cut must be taken on the first unit to increase sales from 1 to 2 units. It is this rationale which explains why the marginal-revenue data of column 4 of Table 27–1 fall short of product price in column 2 for all levels of output save the first.

The second implication of a downsloping demand curve is this: In all imperfectly competitive markets in which such demand curves are relevant—that is, purely monopolistic, oligopolistic, and monopolistically competitive markets—firms have a price policy. By virtue of their ability to influence total supply, the output decisions of such firms necessarily affect product price. This is most evident, of course, in the present case of pure monopoly, where one firm controls total output. Faced with a downsloping demand curve, wherein each output is associated with some unique price, the monopolist unavoidably determines price in

[1] Beware of this pitfall: Because the individual competitive firm's demand curve is perfectly elastic, it does not follow that the monopolist's demand curve will be perfectly *inelastic*. Remember: Even though the individual competitor regards his demand as perfectly elastic, the demand curve for a competitive *industry* is downsloping. The pure monopolist's demand curve is downsloping, but not perfectly inelastic,

because here the firm *is* the industry. As with competitive industry demand, the degree of elasticity or inelasticity which characterizes the pure monopolist's demand curve depends upon those elasticity-determining factors discussed in Chapter 23.

[2] At this point it may be helpful to reread the discussion of the mechanics of this process in Chapter 23.

TABLE 27–1. REVENUE AND COST DATA OF A PURE MONOPOLIST (hypothetical data)

	Revenue data				Cost data			
(1) Quantity of output	(2) Price (average revenue)	(3) Total revenue	(4) Marginal revenue		(5) Average total cost	(6) Total cost	(7) Marginal cost	(8) Profit (+) or Loss (−)
0	$172	$ 0				$ 100		$−100
			$162				$ 90	
1	162	162			$190.00	190		− 28
			142				80	
2	152	304			135.00	270		+ 34
			122				70	
3	142	426			113.33	340		+ 86
			102				60	
4	132	528			100.00	400		+128
			82				70	
5	122	610			94.00	470		+140
			62				80	
6	112	672			91.67	550		+122
			42				90	
7	102	714			91.43	640		+ 74
			22				110	
8	92	736			93.73	750		− 14
			2				130	
9	82	738			97.78	880		−142
			−18				150	
10	72	720			103.00	1,030		−310

deciding what volume of output to produce. The monopolist simultaneously chooses both price and output. In columns 1 and 2 of Table 27–1 we find that the monopolist can sell only an output of one unit at a price of $162, only an output of two units at a price of $152, and so forth.[3]

But all this is not to imply that the monopolist is "free" of market forces in establishing price and output or that the

[3] The notion of a supply curve does not apply in a purely monopolistic (or any other imperfectly competitive) market because of the ability of the seller to control product price. A supply curve shows the amounts producers will offer at various *given* prices which may confront them in the market. But prices are not "given" to the pure monopolist; he does not respond to a fixed price, but rather sets the price himself.

consumer is somehow completely at the monopolist's mercy. In particular, the monopolist's downsloping demand curve means that high prices are associated with low volumes of sales and, conversely, low prices with larger outputs. The monopolist cannot raise price without losing sales or gain sales without charging a lower price. The question which now arises is this: What specific price-quantity combination on his demand curve will the pure monopolist choose? This depends not only upon demand and marginal-revenue data but also upon costs.

Cost Data

On the cost side of the picture we shall assume that, although the firm is a monopolist in the product market, it hires resources

competitively and employs the same technology as our competitive firm in the preceding chapter. This permits us to use the cost data developed in Chapter 25 and applied in Chapter 26, thereby facilitating a comparison of the price-output decisions of a pure monopoly with those of a pure competitor. Columns 5 through 7 of Table 27-1 merely restate the pertinent cost concepts of Table 25-2.

Equating Marginal Revenue and Marginal Cost

A profit-seeking monopolist will employ the same rationale as a profit-seeking firm in a competitive industry. He will produce each successive unit of output so long as it adds more to his total revenue than it does to his total costs. In technical language, the firm will produce up to that output at which marginal revenue equals marginal cost.

A comparison of columns 4 and 7 in Table 27-1 indicates that the profit-maximizing output is 5 units; the fifth unit is the last unit of output whose marginal revenue exceeds its marginal cost. What price will the monopolist charge? His downsloping demand curve of columns 1 and 2 shows there is only one price at which 5 units can be sold: $122.

This same analysis is presented graphically in Figure 27-1, where the demand, marginal-revenue, average-total-cost, and marginal-cost data of Table 27-1 have been drawn. A comparison of marginal revenue and marginal cost again indicates that the profit-maximizing output is 5 units or, more generally, Q_m. The unique price at which Q_m can be sold is found by extending a perpendicular up from the profit-maximizing

FIGURE 27-1. THE PROFIT-MAXIMIZING POSITION OF A PURE MONOPOLIST.
The pure monopolist maximizes profits by producing the MR = MC output. In this instance profit is AP_m per unit; total profits are measured by the white rectangle.
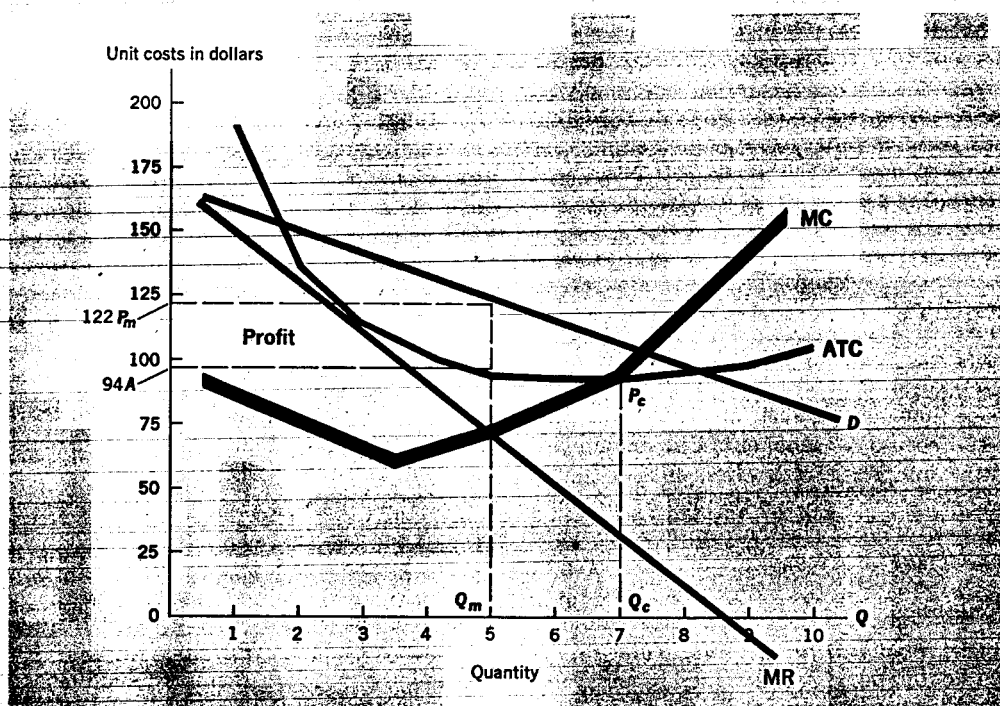
point on the output axis and then at right angles from the point at which it hits the demand curve to the vertical axis. The indicated price is P_m. By charging a price higher than P_m, the monopolist must move up his demand curve, and this means that his sales will fall short of the profit-maximizing level Q_m. To charge less would involve a volume of sales in excess of the profit-maximizing output.

Columns 2 and 5 of Table 27–1 indicate that, at five units of output, product price of $122 exceeds average total cost of $94. Economic profits are therefore $28 per unit; total economic profits are then $140 (or 5 times $28). In Figure 27–1 per unit profit is indicated by the distance AP_m, and total economic profits—the white area—are found by multiplying this unit profit by the profit-maximizing output Q_m.

The same profit-maximizing combination of output and price can also be determined by comparing the total revenue and total costs incurred at each possible level of production. The reader should employ columns 3 and 6 of Table 27–1 to verify all the conclusions we have reached through the use of marginal-revenue–marginal-cost analysis. Similarly, an accurate graphing of total revenue and total cost against output will also show the greatest differential (the maximum profit) at 5 units of output.

Misconceptions Concerning Monopoly Pricing

Our analysis explodes some popular fallacies concerning the behavior of monopolies.

1. Because a monopolist can manipulate output and price, it is often alleged that a monopolist "will charge the highest price he can get." This is clearly a misguided assertion. There are many prices above P_m in Figure 27–1, but the monopolist shuns them for the simple reason that they entail a smaller than maximum profit. Total profits are the difference between total revenue and total costs, and each of these two determi-

nants of profits depends upon quantity sold as much as upon price and unit cost.

2. The monopolist seeks maximum *total* profits, not maximum *unit* profits. In Figure 27–1 a careful comparison of the distance between average cost and price at various possible outputs indicates that per unit profits are greater at a point slightly to the left of the profit-maximizing output Q_m. This is more readily seen in Table 27–1, where unit profits are $32 at 4 units of output as compared to $28 at the profit-maximizing output of 5 units. In this instance the monopolist is accepting a lower-than-maximum per unit profit for the simple reason that the additional sales more than compensate for the lower unit profits. A monopolist would obviously rather sell 5 units at a profit of $28 per unit than sell 4 units at a profit of $32 per unit.

3. It must also be emphasized that pure monopoly does not guarantee economic profits. True, the likelihood of economic profits is greater for a pure monopolist than for a purely competitive producer. In the long run the latter is doomed by the free and easy entry of new firms to a normal profit; barriers to entry permit the monopolist to perpetuate economic profits in the long run. Of course, like the pure competitor, the monopolist cannot persistently operate at a loss. The monopolist must realize a normal profit or better in the long run or will simply not survive. However, if the demand and cost situation faced by the monopolist is less favorable than that shown in Figure 27–1, the monopolist may realize short-run losses. Despite his dominance in the market, the monopolist shown in Figure 27–2 realizes a loss in the short run by virtue of a weak demand and high costs.

Possible Restraints upon Profit Maximization

The comments just made indicate that certain restraints are imposed upon the monopolist by the market. Cost and demand considerations set restrictions upon the
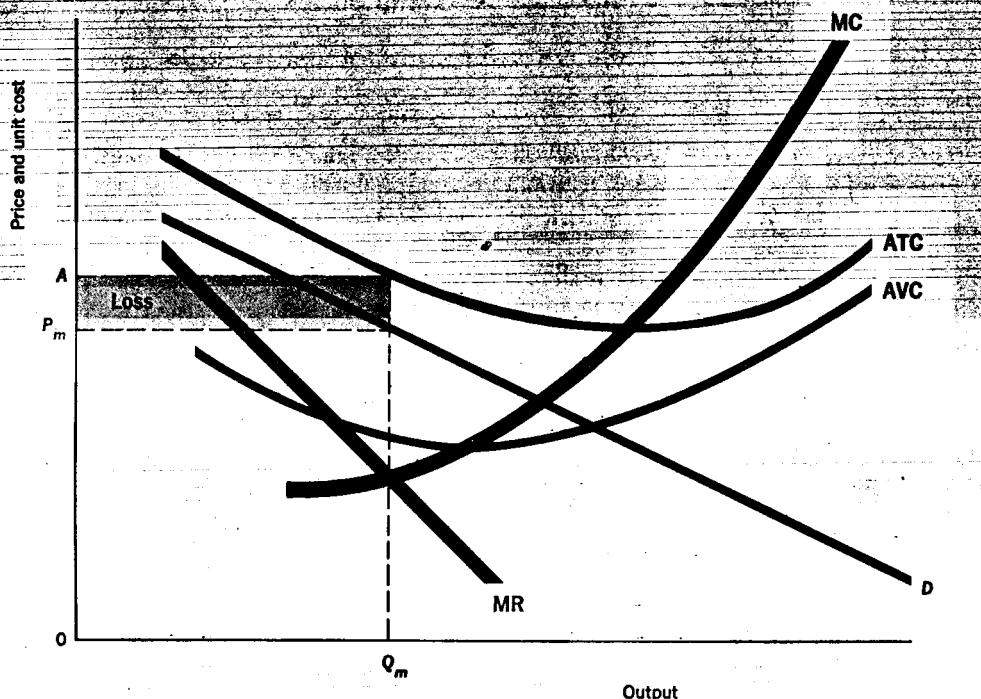
FIGURE 27-2. THE LOSS-MINIMIZING POSITION OF A PURE MONOPOLIST.
If demand D is weak and costs AC are high, the pure monopolist may be unable to make
a profit. He will minimize his losses in the short run by producing at that output where
MR = MC. Loss per unit is AP_m and total losses are indicated by the gray rectangle.

monopolist's price-output behavior. Actually certain other forces may cause the monopolist to exercise restraint; these forces may cause the monopolist purposely to charge a lower price and produce a greater output than is consistent with maximum profits. Two such restraints merit comment.

In the first place, the monopolist does not enjoy anonymity; the identity of monopolistic sellers is typically well known. It follows that the monopolist who fully exploits his market position may find himself the target of public criticism. After all, in Figure 27-1 there are many prices less than P_m which will entail outputs greater than Q_m and still yield substantial economic profits

to the monopolist. If widespread and persistent, such criticism can lead to a loss of good will or, worse yet from the firm's viewpoint, some form of governmental intervention—antitrust action, rate regulation, government stimulation of new competitors or, at the extreme, nationalization of the firm. Thus, from a very long-run standpoint it may be very sensible for the monopolist to avoid unfavorable comment with respect to its market behavior even at the sacrifice of some profits.

Secondly, the monopoly may deliberately limit its profits so as not to attract new competitors. A highly profitable monopoly may cause potential rivals to double their

efforts to overcome the monopolist's barriers. And remember: Barriers to entry are rarely insurmountable over time. Full exploitation of a monopolist's position in the short run may destroy that monopolistic position in the long pull.

The importance of these "voluntary" restraints is subject to heated debate. It would be a mistake to say that they undermine our profit-maximizing analysis; at best they probably cause minor deviations from the most profitable price-output combination.

ECONOMIC EFFECTS

Let us now evaluate pure monopoly from the standpoint of society as a whole. Our emphasis will be upon (1) price, output, and resource allocation, (2) the distribution of income, and (3) economic progress, that is, technological advance. To sharpen our analysis we ignore any possible restraints upon the monopolist's policies and presume that the monopolist seeks the maximum profit that his cost-revenue situation permits.

Price, Output, and Resource Allocation

In Chapter 26 we concluded that pure competition would result in a highly efficient, or "ideal," allocation of resources. In the long run the free entry and exodus of firms would force firms to operate at the optimum rate of output where unit costs of production were at a minimum. Product price would be at the lowest level consistent with average total costs. To illustrate: In Figure 27–1 the competitive firm would sell Q_c units of output at a price of Q_cP_c. Furthermore, long-run competitive equilibrium would also entail an efficient allocation of resources, in that production would occur up to that point at • which price (the measure of a product's value to society) equals marginal cost (the measure of the alternative products forgone by society in the production of any given commodity).

Figure 27–1 indicates that, given the same costs, a purely monopolistic firm will give much less desirable results. As we have already discovered, the pure monopolist will maximize his profits by producing an output of Q_m and charging a price of P_m. It can be readily seen that the monopolist will find it profitable to sell a smaller output and to charge a higher price than would a competitive producer. Furthermore, it is clear that, at Q_m units of output, product price is considerably greater than marginal cost. This means that society values additional units of this monopolized product higher than it does the alternative products which resources could otherwise produce. In other words, the monopolist's profit-maximizing output results in a misallocation of resources; the monopolist finds it profitable to restrict output and therefore employ fewer resources than are justified from society's standpoint.

Given identical costs, a purely monopolistic firm will find it profitable to charge a higher price, produce a smaller output, and foster an allocation of economic resources inferior to that of a purely competitive firm. These contrasting consequences are rooted in the barriers to entry which characterize monopoly.

There is one basic exception to these conclusions: The assumption that the unit costs available to the purely competitive and the purely monopolistic firm are the same does not always hold in practice. Given production techniques and therefore production costs, consumer demand may simply not be sufficient to support a large number of competing firms, each producing at an output which permits it to realize all known economies of scale. In such instances a firm must be large in relation to the market—that is, it must be monopolistic—to produce efficiently (at low unit cost). Our previous discussion of economies of scale as a barrier to entry and the desirability of establishing public utilities in certain fields is based primarily upon such cost considerations (see Chapter 25).

How important is this exception? Most economists feel that it applies for the most part only to public utilities and is therefore

not significant enough to undermine our general conclusions concerning the restrictive nature of monopoly. The best available evidence (see footnote 6 in Chapter 8) suggests that the giant corporations which populate many manufacturing industries now have more monopoly power than can be justified on the grounds that these firms are merely availing themselves of existing economies of scale.

Income Distribution

Business monopoly probably contributes to inequality in the distribution of income in our society. By virtue of their market power monopolists charge a higher price than would a purely competitive firm with the same costs; monopolists are in effect able to levy a "private tax" upon consumers and thereby realize substantial economic profits. These monopolistic profits, it should be noted, are not widely distributed for the simple reason that corporate stock ownership is largely concentrated in the hands of upper income groups. The owners of monopolistic enterprises thereby tend to be enriched at the expense of the rest of society.

Assuming monopoly does contribute to income inequality, is this necessarily undesirable? There is no agreement here, and no scientifically correct answer will ever be found because any view entails a value judgment with respect to what one feels the distribution of income ought to be. Nevertheless, there is a rather widespread feeling in our society that the extreme degrees of income inequality to which pure monopoly frequently contributes are undesirable (see Chapter 37).

Technological Advance

We have already qualified our condemnation of pure monopoly by noting that in a few instances *existing* mass-production economies may be lost if an industry comprises a large number of small, competing firms. There is also a dynamic aspect to this line of reasoning. To be specific, will competition or monopoly foster the more rapid improvement of products and productive techniques? This is fertile ground for honest differences of opinion.

Competitive firms certainly have the incentive—indeed, a market mandate—to employ the most efficient *known* productive techniques. We have seen that their very survival depends upon being efficient. But at the same time competition tends to deprive firms of economic profit—an important means and a major incentive to develop *new* products and *new* improved productive techniques. The profits of technological advance will be short-lived to the innovating competitor. An innovating firm in a competitive industry will find that its many rivals will soon duplicate or imitate any technological advance it may achieve; rivals will share the rewards but not the costs of successful technological research.

In contrast we have seen that a monopolist may persistently realize substantial economic profits. Hence, the pure monopolist will have greater financial resources for technological advance than will competitive firms. But what about the monopolist's incentives for technological advance? Here the picture is clouded.

There is one imposing argument which suggests that the monopolist's incentives to develop new products and new techniques will be weak: the absence of competitors means that there is no automatic stimulus to technological advance in a monopolized market. Because of its sheltered market position, the pure monopolist can afford to be inefficient and lethargic. The keen rivalry of a competitive market penalizes the inefficient; an inefficient monopolist does not face this penalty for the simple reason that he has no rivals. The monopolist has every reason to become satisfied with the *status quo*, to become complacent. It might well pay the monopolist to withhold or "file" technological improvements in both product and productive techniques in order to exploit existing capital equipment fully. New and

improved products and techniques, it is argued, may be suppressed by monopolists to avoid any losses caused by the sudden obsolescence of existing machinery and equipment. And, even when improved techniques are belatedly introduced by monopolists, the accompanying cost reductions will accrue to the monopolist as increases in profits and only partially, if at all, to consumers in the form of lower prices and an increased output. Proponents of this view point out that in a number of industries which approximate pure monopoly—for example, steel and aluminum—the interest in research has been minimal. Such advances as have been realized have come largely from outside the industry or from the smaller firms which make up the "competitive fringe" of the industry.

Basically there are three offsetting arguments:

1. Any gross failure to achieve some minimum level of technological advance will induce public criticism and, in time, government control.

2. Technological advance is a means of lowering unit costs and thereby expanding profits. As our analysis of Figure 27-1 implies, lower costs will give rise to a profit-maximizing position which involves a larger output and a lower price than previously. Furthermore, any expansion of profits will not be of a transitory nature; barriers to entry protect the monopolist from profit encroachment by rivals.

3. Research and technological advance may be one of the monopolist's barriers to entry; hence, the monopolist must persist and succeed in the area of technological advance or eventually fall prey to new competitors.

Which view is more accurate? Frankly, economists are not sure. Most economists do not envision pure monopoly as a particularly progressive market structure. At the same time they acknowledge that agriculture, the industry which most nearly fits the competitive model, has only on rare occasion provided itself with new innovations in product

and method. Government research and the oligopolistic firms which produce farm equipment have provided this competitive industry with most of its improvements in products and techniques. As we shall see in Chapter 29, some respected economists seem to feel that oligopolistic industries, wherein firms are large enough to have the ability to finance research and at the same time are compelled to engage in such research because of the presence of a moderate number of rivals, may be more conducive to technological advance than any other market structure.

Now what can be offered by way of a summarizing generalization as to the economic efficiency of pure monopoly? Simply this: In a static economy, wherein economies of scale are equally accessible to purely competitive and monopolist firms, pure competition will be superior to pure monopoly in that pure competition forces use of the best-known technology and allocates resources in accordance with the wants of society. On the other hand, when economies of scale available to the monopolist are not attainable by small competitive producers, or in a dynamic context in which changes in the rate of technological advance must be considered, the economic inefficiencies of pure monopoly are not so evident.

REGULATED MONOPOLY

Most purely monopolistic industries are "natural monopolies" and therefore subject to social regulation. In particular, the prices or rates which public utilities—railroads, telephone companies, natural gas and electricity suppliers—can charge are determined by a Federal, state, or local regulatory commission or board. Can such regulation improve the social acceptability of monopoly?

Socially Optimum Price

Figure 27-3 is informative. We know that P_m and Q_m are the profit-maximizing price and output which the unregulated monopo-
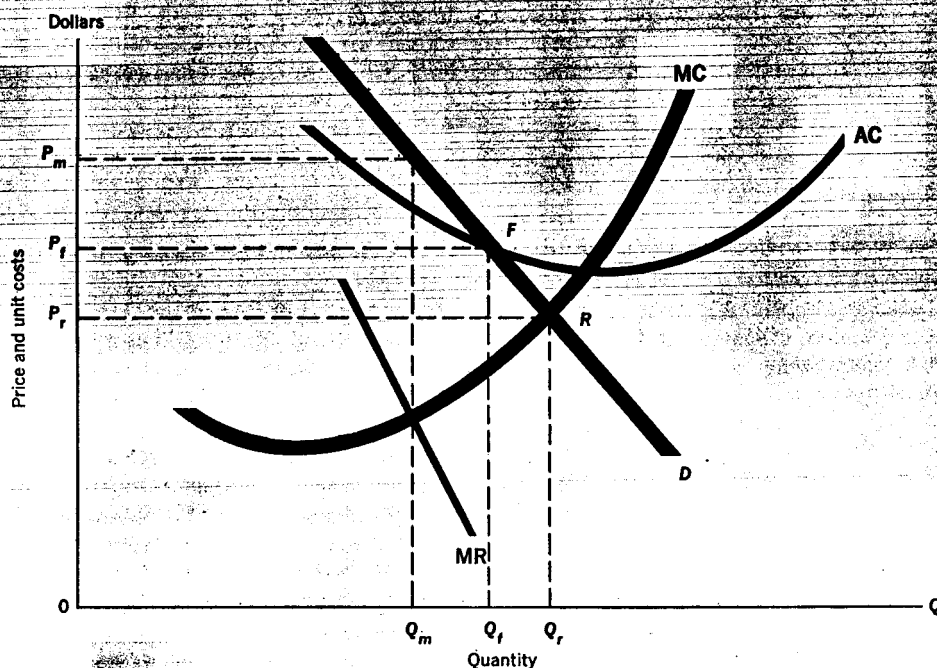
FIGURE 27-3. REGULATED MONOPOLY.
Price regulation can improve the social consequences of a natural monopoly.
The socially optimum price P_r will result in an efficient allocation of resources but
is likely to entail losses and therefore call for permanent public subsidies. The
"fair return" price P_f will allow the monopolist to break even, but will not fully
correct the underallocation of resources.

list would choose. Because price exceeds average total cost, the monopolist enjoys a substantial economic profit which is likely to contribute to income inequality. Furthermore, price exceeds marginal cost, which designates a substantial underallocation of resources to this product or service.

Now if the objective of our regulatory commission is to achieve an efficient allocation of resources, it should obviously establish a legal (ceiling) price for the monopolist that is equal to marginal cost. Remembering that each point on the market demand curve designates a price-quantity combination and noting that marginal cost cuts the demand

curve only at point R, it is quite obvious that P_r is the only price which is equal to marginal cost. The imposition of this maximum or ceiling price causes the monopolist's effective demand curve to become P_rRD; the demand curve becomes perfectly elastic, and therefore $P_r = MR$ out to point R, where the regulated price ceases to be effective. The important point is that, given the legal price P_r, the monopolist will maximize profits by producing Q_r units of output because it is at this output that MR (P_r) = MC. By making it illegal to charge more than P_r per unit, the regulatory agency has eliminated the monopolist's incentive to restrict output

in order to benefit from a higher price. In short, by imposing the legal price P_r and letting the monopolist choose his profit-maximizing output, the allocative results of pure competition can be simulated. Production takes place where $P = $ MC, and this equality indicates an efficient allocation of resources to this product or service.

"Fair-return" Price

But the socially optimum price P_r is likely to pose a problem of losses for the regulated firm. The price which equals marginal cost is likely to be so low that average total costs are not covered. The inevitable result is losses. The reason for this lies in the basic character of public utilities. Because they are required to meet "peak" demands (both daily and seasonally) for their product or service, they tend to have substantial excess productive capacity when demand is relatively "normal." This high level of investment in capital facilities means that unit costs of production are likely to decline over a wide range of output. In technical terms the market demand curve in Figure 27-3 cuts marginal cost at a point to the left of the marginal-cost–average-total-cost intersection, so the socially optimum price is necessarily below AC. Therefore, to enforce a socially optimum price upon the regulated monopolist would mean short-run losses and in the long run bankruptcy for the utility.

What to do? In practice regulatory commissions have tended to back away somewhat from the objective of allocative efficiency and marginal-cost pricing. Most regulatory agencies in the United States are concerned with establishing a "fair-return" price. This is so in no small measure because, as the courts have envisioned it, an unembellished socially optimum price would lead to losses and eventual bankruptcy and thereby deprive the monopoly's owners of their private property without "due process of law." Indeed, the Supreme Court has held that the regulatory agencies must permit a "fair return" to owners.

Remembering that total costs include a normal or "fair" profit, the "fair" or "fair-return" price in Figure 27-3 would obviously be P_f. Because the demand curve cuts average cost only at point F, it is clear that P_f is the only price which permits a fair return. The corresponding output at regulated price P_f will be Q_f.

Dilemma of Regulation

A comparison of the results of the socially optimum price and the "fair-return" price suggests a policy dilemma. When price is set to achieve the most efficient allocation of resources ($P = $ MC), the regulated utility is likely to suffer losses. Survival of the firm would presumably depend upon permanent public subsidies out of tax revenues. On the other hand, although a fair price allows the monopolist to cover costs, it only partially resolves the underallocation of resources which the unregulated monopoly would foster. That is, the fair-return price would only increase output from Q_m to Q_f, whereas the socially optimum output is Q_r. Despite this knotty problem, the basic point is that regulation can improve upon the results of monopoly from the social point of view. Price regulation can simultaneously reduce price, increase output, and reduce the economic profits of monopolies.[4]

SUMMARY

1. A pure monopolist is the sole producer of a commodity for which there are no close substitutes.

2. Barriers to entry, in the form of **a.** economies of scale, **b.** natural monopolies, **c.** the ownership or control of essential raw materials, **d.** patent ownership and research,

[4] The interested reader should consult Clark Lee Allen, James M. Buchanan, and Marshall R. Colberg, *Prices, Income, and Public Policy*, 2d ed. (New York: McGraw-Hill Book Company, 1959), chap. 30, from which the above discussion has benefited.

e. unfair competition, and **f.** economies of being established, help explain the existence of pure monopoly and other imperfectly competitive market structures. Barriers to entry which are very formidable in the short run may prove to be surmountable in the long run.

3. The pure monopolist's market situation differs from that of a competitive firm in that the monopolist's demand curve is down-sloping, causing the marginal-revenue curve to lie below the demand curve. Like the competitive seller, the pure monopolist will maximize profits by equating marginal revenue and marginal cost. Barriers to entry may permit a monopolist to acquire economic profits even in the long run. It is noteworthy, however, that **a.** the monopolist does not charge "the highest price he can get"; **b.** the maximum total profit sought by the monopolist rarely coincides with maximum unit profits; and **c.** high costs and a weak demand may prevent the monopolist from realizing any profit at all.

4. Given the same costs, the pure monopolist will find it more profitable to restrict output and charge a higher price than would a competitive seller. This restriction of output causes resources to be misallocated, as is evidenced by the fact that price exceeds marginal cost in monopolized markets.

5. Monopoly tends to increase income inequality.

6. Economists disagree as to how conducive pure monopoly is to technological advance. Some feel that pure monopoly is more progressive than pure competition because its ability to acquire economic profits provides for the financing of technological research. Others, however, argue that the absence of rival firms and the monopolist's desire to exploit fully his existing capital facilities weaken the monopolist's incentive to innovate.

7. Price regulation can be invoked to eliminate wholly or partially the tendency of monopolists to underallocate resources and to earn economic profits.